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INFORMATION DISORDER AND THE NEED FOR NEWS LITERACY EDUCATION IN
THE DIGITAL ERA

An Undergraduate Honors Thesis
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ABSTRACT

This paper serves as a comprehensive report on the need for and barriers to news literacy education in the United States. Current misinformation issues in the U.S. are introduced and the importance of news literacy among citizens of a democracy. Answers to these questions are sought: What are the current challenges regarding news literacy in the digital age and what are the implications? Further, can news literacy be taught? Based on measured practices, what are the best methods for news literacy education? Existing literature covers the topics of information disorder and news literacy, highlighting the importance of news literacy in informing citizens. Several factors challenge widespread news literacy, such as the overwhelming amount of information users are met with each day and the echo chambers on social media they operate in. Several existing news literacy curricula are outlined and their effectiveness in teaching students how to sort fact from fiction in digital news sources using critical thinking activities are evaluated. After demonstrating the need for news literacy among U.S. readers in the digital era and discussing existing news literacy pedagogy, I hold news literacy initiatives are but one solution in the complex fight against misinformation, and their success in educating students to access veracity is difficult to measure.

Key words: News literacy, media manipulation, misinformation, news information disorder, journalism, online communications

I. INTRODUCTION

In September 2017, Facebook announced its discovery of \$100,000 in ad spending on its site by a so-called “troll farm,” the Internet Research Agency, a group that has developed memes, YouTube videos, Twitter accounts, and Facebook posts aimed at swaying political conversation in major global elections. Then in February 2018, thirteen Russians and three Russian entities – including the Internet Research Agency – were criminally indicted for their interference in the 2016 U.S. presidential election through these posts, activity that began as early as 2014. A February 16 *New Yorker* opinion article said the operation followed a “playbook for manipulating American democracy using a mix of classic espionage, private-sector social-media tools, and partisan ideology” (Osnos). The indictment said the agency attempted to manipulate public opinion by spreading conspiracies and false information that mostly promoted Trump and mostly damaged opponent Hillary Clinton (“Internet Research Agency Indictment,” 4). According to the report, the Internet Research Agency contacted over 100 Americans via fake accounts, including several involved with the Trump campaign, who would, according to the indictments, “unknowingly” become tools used by the agency to spread the Russian-created propaganda (“Internet Research Agency Indictment,” 3). The indictment did not conclude that the interference had any success in swaying the election results, but Facebook estimated that about 126 million people – nearly two of every five people in the United States – likely saw content or followed accounts produced by the Internet Research Agency between January 2015 and August 2017 (Glaser).

What could have been done to prevent this “information warfare” against the U.S.? Why was it so easy to manipulate public opinion using fabricated news stories? The same *New Yorker*

op-ed cited news illiteracy as a powerful factor in the success of Russian interference in the election (Osnos). The author said the Russian fraud offers some “embarrassing insight”: Americans are not equipped to assess credibility of the media they consume. “Even the trolls themselves were surprised at what Americans would believe,” the article reads.

In the opening scene of the pilot of HBO series “The Newsroom,” anchor of fictional Atlantis Cable News channel anchor, Will McAvoy, is asked “What makes America the greatest country in the world?” by a college student at a panel discussion. In a three minute rant to a packed lecture hall, McAvoy responds that America is in fact not the greatest country in the world – it “used to be.” He lists several reasons he believes have contributed to the decline of the U.S. as “great,” such as heightened political polarization, the issue of mass incarceration, and high amounts of defense spending. He finishes the monologue with this assertion: “The first step in solving any problem is recognizing there is one.” Thus, this paper serves as recognition of the problem of news illiteracy and the spread of false information. It also serves as a conversation about the steps being taken to develop solutions to these issues interfering with the education of citizens and, by extension, the integrity of democratic processes.

According to most ethicists (Elliott; Hodges), the primary role of the news media in a democratic society is to provide citizens with information that will help them to make informed political choices (Patterson and Wilkins). News organizations are expected to be both society’s “watchdog” and “guide dog” – holding those that govern accountable and helping citizens navigate the political process (Patterson and Wilkins). This role was first defined by British parliament member Edmund Burke, who called the media the “Fourth Estate” during his speech to the House of Commons (S.J. Ward).

In her book *Between Past and Future: Eight Exercises in Political Thought*, political philosopher Hannah Arendt expresses a similar sentiment: knowledge of the truth is crucial to the healthy function of political life:

“Freedom of opinion is a farce unless factual information is guaranteed and the facts themselves are not in dispute. In other words, factual truth informs political thought just as rational truth informs philosophical speculation” (Arendt 234).

The responsibilities of an independent press have remained the same, but an ever-increasing degree of information pollution has created hurdles in the mission to educate and inform readers. If information disorder is not a new phenomenon, what factors have influenced increased inaccuracy and bias in the news information American citizens daily consume? Changes in technology, such as the emergence of social media, have brought about transformation in the way information is published, shared, and processed. Americans spend twice as much time online today than they did in 2008 (Meeker 9). Adult users spend about 6 hours browsing the Internet, meaning an excessive amount of information competes for users’ attention. Studies have found that this information overload results in limited individual attention and thus virality of low-quality information (Menczer et al.). The correlation between a greater amount of information and the sharing of lower-quality content impacts Internet users’ online news consumption.

According to an October 2017 Pew Research study (Bialik and Matsa), 43 percent of Americans report getting their news from online and two-thirds of Americans (about 67 percent) get some of their news from social media. More than half (55 percent) of Americans ages 50 and older report getting their news from social media, with 74 percent of that news being consumed

on Twitter. However, the study showed many Americans distrust the information they read online, with just 5 percent reporting they believe the news they read on their social media feeds. This trust level may be so low because users report they have seen misinformation shared via social media. About half (51 percent) say they have often seen political news that is somewhat inaccurate. Thirty-two percent report seeing news that is totally fabricated. Almost a quarter (23 percent) say they have shared misinformation themselves, half of these said they probably did unknowingly. Most respondents (84 percent) said they were confident in their ability to sort fact from fiction in the news. The issue, as this paper will discuss, is that consumers are more confident in this ability to verify information than they should be.

This idea of fictitious information shared via a news source has been given a name. The now all-pervasive phrase “fake news” was used by then-presidential candidate Donald J. Trump to describe what he believed to be misinformation published about him and his campaign by the mainstream media. It began with Trump’s December 2016 tweet in response to several reports that he would serve as an executive producer of *The Celebrity Apprentice* while also serving as president:

“Reports by @CNN that I will be working on The Apprentice during my Presidency, even part time, are ridiculous & untrue - FAKE NEWS!”

Since this tweet, Trump has tweeted the phrase “fake news” 162 times as of February 5, 2018 (Brown). The term has been used, not because the news has been indeed false, but because he disagreed with the way a news organization had described him. The president has taken ownership of the phrase, and in January 2018, he dealt out “Fake News Awards” to reporters for the *New York Times*, *ABC News*, and the *Washington Post*, as well as stories from *CNN*, *Time*, *Newsweek*, and the *New York Times*. He also awarded a specific topic a “Fake News” award:

“Russia Collusion,” which was described as “perhaps the greatest hoax perpetrated on the American people,” by the president (“Everything President Trump Has Tweeted (and What It Was About”).

“Fake news” was 2017’s Word of the Year according to Collins English Dictionary, which defines it as “false, often sensational, information disseminated under the guise of news reporting” (“Word of The Year 2017”). The phrase has existed for more than a century, but Collins said the word saw a usage increase of 365 percent from 2016 to 2017 – most likely because of its use by the leader of the free world. However, this use of the phrase “fake news” adds to the confusion surrounding the information disorder in the media. It is true that there is an information disorder in the U.S. – as demonstrated in the aforementioned work of the Internet Research Agency – but simultaneously, politicians are using the phrase to deem evidence-based reporting as “fake” when it paints them in a negative light. Because of varying contexts of the phrase, there is danger that its use may devalue the authority of news publications (“Fighting Fake News Workshop Report” 3). Thus, for the purposes of this report, “fake news” is an inaccurate phrase to describe the state of misinformation in the U.S. First Draft News Coalition identifies three types of information disorder: Mis-, dis- and mal-information (Wardle 5) – terms I will use accordingly throughout this paper. Misinformation is false information shared without intention of harm. Dis-information is that which is knowingly shared in order to cause harm. Finally, mal-information is true information shared to cause harm. Mal-information is typically private information that is made public, the publishing of which is sometimes referred to as “doxxing.”

Although the information disorder in the American news media goes beyond news about national, state, and local politics, this paper will focus primarily on the challenges misinformation in the news poses to the well-being of a democracy. This choice is due to the heightened discussion about misinformation's impact on the U.S. political process, following the circulation of false and misleading information during the 2016 presidential election. The way in which this misinformation was able to confuse and mislead so many readers has brought into question the ability of U.S. news consumers to sort fact from fiction. After a review of the current state of information pollution in the U.S, the question that arises is this: *Can news literacy be taught to a polarized population with a low attention span and a distrust of the media? What are the best practices, if any, in educating the public how to evaluate what they read?*

The following paper will begin by defining news literacy and discussing the importance of news literacy among members of a democracy. I will outline the existing challenges preventing widespread news literacy – such as an increase in the amount of and availability of news, the power of media manipulators, and the issue of the online echo-chambers media consumers operate in, fueled by the increased use of social media. I will introduce and evaluate current methodology in teaching news literacy via schools and foundations focused on fighting the information pollution issue. Finally, based on the discussion about which methods in news literacy education are best-designed to address the misinformation challenges that exist in the modern digital era, I will consider whether an effective news literacy education is possible.

II. DEFINING NEWS LITERACY AND THE IMPORTANCE OF NEWS LITERACY

What is news literacy?

Media literacy is defined by the Media Literacy Project as “the ability to access, analyze, evaluate, and create media” (“What Is Media Literacy?”). Although this definition is still applicable to news literacy, it should be narrowed for the purpose of this discussion focused only on the news media. More specifically, news literacy is centered around how and why news consumers engage with news information how they make sense of it, and how they are affected by their consumption (Maksl et al. 29). Stony Brook’s Center for News Literacy holds “media literacy” is about differentiating between types of media within the realms of marketing, propaganda, and pop culture (Jolly). In contrast, they define news literacy curriculum as instituting methods that promote a healthy skepticism of the news one reads and teaching ways of verifying the information communicated in these news sources. Making the distinction between media literacy and news literacy has proven important in developing effective news literacy curriculum. Rather than simply being a subset of media literacy, media literacy curriculum-developers have found news literacy needs an educational framework all its own because of the important role informing self-governing citizens plays in the function of a democracy (“Media Literacy, News Literacy, or News Appreciation?” 148). News literacy, as opposed to media literacy, focuses on growing engagement with the news, awareness of current events, and a deeper knowledge of the role of journalists (“Media Literacy, News Literacy, or News Appreciation?” 157).

In recent history, many within the journalism industry have recognized a need to educate citizens how to analyze the news they consume. After a 35-year journalism career, most recently

as editor of Pulitzer-prize winning *Newsday*, Howard Schneider founded the School of Journalism at Stony Brook University in 2006. As an adjunct professor of journalism at Stony Brook, he taught a course in the values and ethics of the media. In his course, he observed the majority of students he taught were “lost in the digital flood of information or had adopted a defensive cynicism, unwilling to trust that information could be anything other than spin” (“Our History”). Schneider saw the role of journalism schools as greater than just preparing the next generation of reporters but, rather, also informing the next generation of consumers and citizens to recognize true journalism and support it (Lynch). With this in mind, he collaborated with other faculty at Stony Brook to develop a journalism school curriculum that would accomplish both these goals: equipping the journalist and empowering the consumer by helping students recognize their biases and see the importance of producing and consuming reliable information. Using a \$1.7 million grant from the John S. and James L. Knight Foundation, Schneider led the creation of a 15-week “news-literacy” course, which would be required for all journalism majors to take, but open to all Stony Brook students (Beyerstein). Stony Brook became home to the first university-wide news literacy course and the only university-based Center for News Literacy.

Since 2007, Stony Brook has taught news literacy to over 10,000 undergraduate students on their campus and 7,000 students enrolled in localized versions of the course. This course has also made its way into junior and senior high schools in New York and Chicago, and as of January 2017, Stony Brook further extended its reach through an online course offered to any group titled “Making Sense of the News: News Literacy Lessons for Digital Citizens” (“What is News Literacy?”) According to their site, the main goal of Stony Brook’s news literacy curriculum is to help news consumers develop critical thinking skills in order to: be able to

distinguish between journalism and other information as well as recognizing differences between journalists and others publishing information online; recognize the difference between news and opinion; analyze the difference between assertion and verification and between evidence and inference in a news story; evaluate a news story based on the quality of information and reliability of sources cited; and distinguish between news media bias and audience bias. In addition to reinforcing critical thinking skills, Stony Brook has four other objectives for those who utilize their news literacy course: 1) to appreciate the power of reliable information and the importance of transparent and accurate news reporting in a democracy; 2) understanding the value of news and how being a critical news consumer can influence others; 3) understanding the role of a journalist, including how journalists make decisions and mistakes in reporting; understanding the structure of the media landscape in order to understand the responsibilities of producer and consumer in the digital age. In many ways, Stony Brook led the development of news literacy curriculum – 30 U.S. universities have adopted all or part of Stony Brook’s model for their news literacy courses and in recent history, Hong Kong, Mainland China, Malaysia, Australia, Vietnam, Israel, Russia, Poland, and Myanmar have partnered with Stony Brook to develop curricula to be incorporated into their schools (“What is News Literacy?”) Because of this, Stony Brook will serve as the basis for a curriculum model, but several existing teaching models will be discussed and evaluated later in this report.

News illiteracy among young people

The importance of news literacy education can be demonstrated by existing research regarding the short attention spans and lack of discernment many young people have when it

comes to online news consumption. Faculty at The Poynter Institute – a leader in online journalism training – said their hope is to embed news literacy curriculum into K-12 classrooms (Jolly). Researchers argue for the teaching of news literacy specifically in secondary schools because this age group makes up a large portion of online media consumers and the news processing and sharing habits this group develops will expand or hinder future news literacy. Existing research demonstrates this age group may not currently be equipped to successfully choose reliable news sources and evaluate the content they find online – due in part to the overload of news they feel they are bombarded by online (“Teens Know” 7). The Newspaper Association of America Foundation surveyed nearly 100 U.S. teenagers ages 13-18 and found the majority are “only somewhat interested in news...they want to be ‘informed’ but don’t want to spend too much time getting information” (“Teens Know” 3). They “seldom seek out news” and they “like it when a story reaches out and ‘catches [their] eye’ and makes them want to read it” (“Teens Know” 3). Further, if the events of the news are stressful or hard to understand, teenagers are unlikely to read on, and if they feel too much is competing for their attention, they will click away (“Teens Know” 3, 5).

A 2016 Stanford study had similar findings when it tested 7,800 middle school, high school and college students from 12 states on their ability to evaluate information online (Wineburg et al.). The researchers presented the *Slate* homepage to middle schoolers and asked the students to distinguish between news stories and advertisements on the page. Additionally, they showed the students screenshots of tweets, Facebook posts, and a mock-up of *CNN*’s website in order to evaluate other news literacy skills – determining newsworthiness and trustworthiness of a tweet, judging the reliability of sponsored content, as well as distinguishing

between an opinion and news article. At the high school level, students were asked to compare and evaluate two posts from an online news publication's comment section, identify verified sources on Facebook, evaluate the strength of arguments two Facebook users make in an online exchange, decide whether a photo posted on a photo-sharing site is trustworthy, and determine whether a news story or sponsored story is more reliable. Finally, the college-level students were asked to make an open web search and determine which sites would be credible to gain information from, verify a claim about a controversial topic by researching online, determine whether a partisan site is credible, identify the strengths and weaknesses of an online video, and explain the usefulness or uselessness of a tweet. In the middle school *Slate* study, students successfully identified traditional news stories and traditional advertisements. However, "sponsored content" on the site's homepage tripped up many students, with 80 percent believing a native advertisement was a real news story. This may suggest a lack of understanding among young people of what "sponsored content" on a news site is. The high school students given a photo produced by a non-verified source were mostly trusting of the evidence it provided about conditions near a power plant. Less than 20 percent questioned the source of the post or photo that accompanied it, and 25 percent said the post did not provide strong evidence, but nearly 40 percent said the post did provide strong evidence for the claim it made alongside the doctored photo. By and large, this age group relied on the photo in evaluating the trustworthiness of the claim in the post. The university students were given a tweet from a liberal advocacy group that shared poll results from another liberal group, the Center for American progress, pertaining to public opinion about background checks for gun owners. They were asked to determine if the tweet's information would be useful or not useful source. Less than a third explained that the poll

was conducted by a liberal-leaning group that would advocate for stricter gun-control measures and that this might influence the poll results. A few students said the tweet could be considered a strong source of information because it was conducted by a professional polling firm. Many said there was danger in sharing poll results on social media without context because few Twitter users will go on to investigate the organization behind the tweet and use this context to determine whether the information presented is biased or not. These are just three examples of tasks the Stanford group used to test the “civic online reasoning” of students, but they illustrate the conclusion the researchers came to: young people’s ability to critically think about information online is “bleak.” These studies (“Teens Know”; Wineburg) demonstrate that many young people lack the desire or skills to sift through the overabundance of news content, so they are deterred from becoming informed, or do not take steps to verify a source’s credibility when they do choose to read and share news. Thus, expanding news literacy skills among this age group is critical in order to shape the next generation of news consumption.

Most American high school civics and government teachers believe students should know how to identify, gather and produce credible information, and many call for more training and support in incorporating these topics in their classrooms (Kawashima-Ginsberg et al.). But according to media literacy scholar Renee Hobbs, organizations focused on news literacy will have to find ways to convince some teachers of the value of a news literacy program in their classrooms (Jolly). Hobbs said some teachers have already expressed disinterest or fear toward news literacy curriculum in their classrooms because of the polarization that exists in the study of current events. In order to counter hesitant and hostile ideas about news literacy, news literacy agencies are focusing on educating the public about the challenges the Internet and social media

poses to the verification and validation of news and the importance of educating a young generation how to critically consume it.

Stony Brook summarizes four major reasons news literacy has gained importance in the digital age (“What is News Literacy?” 1) The overwhelming amount of information vying for Internet users’ attention makes it increasingly difficult to sort fact from fiction; 2) New technology has made it easier to create and share misinformation on a site disguised as a legitimate news source; 3) News consumers want information to be communicated quickly and easily to them, which creates opportunities for inaccuracies; 3) Social media has made it easier to consume information that aligns with a users’ preexisting beliefs, reinforcing misinformation we may believe rather than balancing and challenging it. These issues will be expanded upon in the following section of this paper, “Challenges to News Literacy.”

III. CHALLENGES TO NEWS LITERACY

The news landscape has transformed due to developments in technology and a growing number of resources and platforms for news consumers to choose from. Although these changes have ushered in greater public access to news and news that is rapidly published and rapidly updated, several negative outcomes for journalism have emerged in the digital age as well. The Internet bombards online news consumers with options – some options better than others. Thus, this increase in the amount of and availability of news has contributed to a confusion among readers about what constitutes as a trustworthy news source. This complexity can lead to apathy and disengagement or the sharing of unreliable sources that look and read like verified news publications. Studies have shown (Wardle; Weeks) the Internet has made it increasingly easier

for news consumers to find and share news that fits their pre-developed cognitive biases, creating echo chambers where much of the information is unbalanced and the beliefs of readers are never challenged nor met with the truth. In a similar vein, increased political polarization – in tandem with a distrust in the media – has granted Internet trolls fertile ground on social media sites to plant misinformation with the power to sway public opinion. These factors combined challenge the likelihood that news consumers will read, watch, and hear information with critical thinking skills in order to successfully evaluate its validity. The following will discuss the challenges that currently prevent widespread news literacy among American citizens.

The issue with “fake news”: definition and scope

In March 2017, the Information Society Project at Yale Law School and the Floyd Abrams Institute for Freedom of Expression held a workshop aimed at identifying the harms of “fake news” and discussing possible interdisciplinary solutions to the issues associated with information disorder (“Fighting Fake News Workshop Report”). Similar to the aforementioned assertion made by First Draft News (Wardle 5), the Yale workshop participants agreed using the phrase “fake news” can confuse citizens who associate the term with Donald Trump’s usage of it. According to the Yale panel, the use of “fake news” may perpetuate the idea sown by Trump that authoritative, objective news publications are illegitimate and produce biased falsities. The spread of this idea of the news media being “fake” has the power to undermine rational discourse about current events that should take place in a democracy. Throughout history, labeling something as “fake news” has been a propaganda tactic used by oppressive regimes to silence dissent – in World War I the Nazi regime used the phrase “lying press” to refer to enemy

propaganda (Griffing). Due to the many different contexts the phrase has been used in, the participants in the Yale discussion were unable to reach a shared definition of “fake news.” Instead, workshop participants chose to use First Draft’s seven types of mis- and disinformation (Wardle 17) in their discussion, which are based on degrees of falsity and intentionality.

In the introduction to her recent report, *Lexicon of Lies*, for Data & Society, media historian and theorist Caroline Jack reinforces this idea that words matter when it comes to defining the issue of media manipulation:

“Journalists, commentators, policymakers, and scholars have a variety of words at their disposal — propaganda, disinformation, misinformation, and so on — to describe the accuracy and relevance of media content. These terms can carry a lot of baggage. They have each accrued different cultural associations and historical meanings, and they can take on different shades of meaning in different contexts. These differences may seem small, but they matter. The words we choose to describe media manipulation can lead to assumptions about how information spreads, who spreads it, and who receives it. These assumptions can shape what kinds of interventions or solutions seem desirable, appropriate, or even possible” (Jack 1).

Simply put, the way the issue of information pollution is described can affect the way the public views the issue and citizens’ understanding of the issue affects the way the problem can be addressed in the future. Consequently, both First Draft News and the Yale workshop members focused on ways to best explain the complex phenomena of information pollution. Yale workshop participants pointed out a difference between news that is false from inception and information that is not necessarily false but its information presented misleadingly (“Fighting Fake News Workshop Report” 3). Similarly, First Draft argues the importance of separating the agent, the message, and the interpreter of the information in order to gain better understanding of the intent, target and framing of the news (Wardle 7). They also highlight a need to examine the

phases of information disorder: the creation of the message, the reproduction of the message into a media product, and the public distribution of this media product. According to First Draft's report, this distinction is important because the agent that created the original piece can be different than the agent that framed the news in a misleading way and distributed it. This separation can aid in understanding who these agents are and what motivates them to spread misinformation. It can also help in explaining if the information is being shared as the original agent intended or if it is shared with a conflicting message that spreads a false rumor (Wardle 7).

In March 2018, researchers at MIT announced their discovery that false information consistently outperforms true information on Twitter (Vosoughi et al.), reaching more people more quickly. Soroush Vosoughi, Deb Roy, and Sinan Aral compiled a data set of approximately 126,000 news stories in the English language distributed on Twitter between 2006 and 2017 and compared the diffusion of the false and true stories. These stories were tweeted by 3 million people more than 4.5 million times. Vosoughi and colleagues scraped six independent fact-checking organizations (snopes.com, polifact.come, factcheck.org, truthorfiction.com, hoax-slayer.com, and urbanlegends.about.com) for online rumors that had circulated on Twitter between 2006 and 2016, then they searched for the corresponding tweets. This allowed them to collect these Twitter rumor cascades and, using information from the third-party fact-checking organizations, noted whether these tweets had been verified as true or false by these groups. Then they quantified the number of retweets by unique users over time, the maximum breadth of the tweet, as well as its structural vitality. The data showed false stories were 70 percent more likely to get retweeted than verified news, a statistic driven by real, human users, not bots, according to the study's report. Overall, falsehoods spread significantly "farther, faster, deeper

and more broadly” than the truth in all categories of information. The spread of false rumors peaked at the end of both 2013 and 2015 as well as at the end of 2016 after the U.S. presidential election. The data demonstrated a noticeable increase in the circulation of the total number of false political rumors during the 2012 and 2016 U.S. presidential elections. Politics was the largest rumor category, making up approximately 45,000 cascades, exhibiting broader, deeper, and faster reach than other categories. Vosoughi and colleagues said one explanation for the why these false rumors travel so far, so quickly is due to their novelty:

“Novelty attracts human attention, contributes to productive decision-making, and encourages information sharing because novelty updates our understanding of the world. When information is novel, it is not only surprising, but also more valuable, both from an information theoretic perspective [in that it provides the greatest aid to decision-making] and from a social perspective [in that it conveys social status on one that is “in the know” or has access to unique “inside” information]. We therefore tested whether falsity was more novel than the truth and whether Twitter users were more likely to retweet information that was more novel” (Vosoughi et al.)

To examine this theory, the researchers randomly selected approximately 5,000 users who had promoted true and false stories on Twitter and looked at a random sample of about 25,000 tweets these users had been exposed to in the 60 days before they retweeted a false rumor. Using a language processor, they were able to calculate the distance in topic between the rumor tweets the users had retweeted and prior tweets users had been exposed to. They found that the rumor tweets displayed significantly higher information uniqueness, making them significantly more novel than the truthful tweets the users had been exposed to. Vosoughi and colleagues’ other theory about the cause of the falsehoods’ broad, deep, and fast reach was that this false content is typically negative and elicits strong emotions in online users who are exposed to it. To test this, the researchers assessed the emotions in replies to true and false

rumors. They found the false rumors had replies expressing greater surprise and greater disgust, whereas true rumors had the feelings of sadness, joy, anticipation, and trust attached to them. Thus, in addition to the novelty of these false stories, the domination of falsehoods on Twitter can be explained by the tweets' arousal of strong emotions.

In a series of tweets, CEO Jack Dorsey responded to the study's recent findings, after Twitter released a statement saying it hoped to collaborate with fake news experts in the future to curb this issue. "We're committing Twitter to help increase the collective health, openness, and civility of public conversation, and to hold ourselves publicly accountable towards progress," Dorsey tweeted on March 1, 2018. Sixteen political scientists and legal scholars offered their opinions about the study and its implications for the online news ecosystem in a *Science* essay published the same day as the study:

"We must redesign our information ecosystem in the 21st century[...]to reduce the spread of fake news and to address the underlying pathologies it has revealed[...] How can we create a news ecosystem...that values and promotes truth?" (Lazer).

The popularity and visibility of false news stories was also demonstrated in a 2016 analysis by BuzzFeed, which found viral fake election stories generated more engagement than the performance of the top election stories from 19 major news outlets combined (Silverman). In the three months leading up to the election, 20 top false election stories had a combined 8,711,000 shares, reactions, and comments on Facebook. In comparison, the top-performing *New York Times* election story accumulated just 370,000 engagements. Collectively, the top 20 genuine news stories generated 7,367,000 shares, reactions, and comments on Facebook. All but three of the fake stories were pro-Donald Trump or anti-Hillary Clinton. According to these

examples of “fake news,” Hillary Clinton sold weapons to ISIS, Ireland was accepting American “refugees” fleeing Trump’s America, and that then-vice presidential candidate Mike Pence said Michelle Obama is the “most vulgar first lady we’ve ever had” (Gillin). Most of these stories have since been taken down. Shortly after the election, Facebook CEO Mark Zuckerberg said the idea that these stories had swayed the election was “a pretty crazy idea” (Lee). But a few days later, Zuckerberg wrote a statement that said Facebook was developing ways to flag fake news stories on its site. Then about a year later in September 2017, Zuckerberg said he regretted calling this notion that fake news could have influenced the election “crazy,” after Facebook admitted trolls were able to manipulate the news feed algorithm to spread misinformation and that the company sold \$100,000 in advertising to the Russian-controlled Internet Research Agency (Wagner). One of the top-performing fake news stories claimed Pope Francis publicly endorsed Donald Trump “shocking the world” (Ritchie). According to BuzzFeed, this story had racked up 960,000 Facebook engagements by November 8, 2016. On January 24, 2018, Pope Francis released a message warning about the power of “fake news,” which he defined as “the spreading of disinformation online or in the traditional media” (Francis). He said in his statement that the issue of “fake news” dates back to the book of Genesis, where the serpent communicated misinformation to Adam and Eve to tempt them into sin. Pope Francis encapsulated the issues contributing to the spread of fake news and why it appeals to human nature:

“The effectiveness of fake news is primarily due to its ability to *mimic* real news, to seem plausible. Secondly, this false but believable news is “captious,” inasmuch as it grasps people’s attention by appealing to stereotypes and common social prejudices, and exploiting instantaneous emotions like anxiety, contempt, anger and frustration. The ability to spread such fake news often relies on a manipulative use of the social networks and the way they function. Untrue stories can spread so quickly that even authoritative

denials fail to contain the damage. The difficulty of unmasking and eliminating fake news is due also to the fact that many people interact in homogeneous digital environments impervious to differing perspectives and opinions. *Disinformation* thus thrives on the absence of healthy confrontation with other sources of information that could effectively challenge prejudices and generate constructive dialogue; instead, it risks turning people into unwilling accomplices in spreading biased and baseless ideas. The tragedy of disinformation is that it discredits others, presenting them as enemies, to the point of demonizing them and fomenting conflict. Fake news is a sign of intolerant and hypersensitive attitudes, and leads only to the spread of arrogance and hatred. That is the end result of untruth” (Francis).

The Pope then called for the education of citizens on how to discern a truth from a lie, so fewer might fall victim to believing fake news:

“That is why education for truth means teaching people how to discern, evaluate and understand our deepest desires and inclinations, lest we lose sight of what is good and yield to every temptation” (Francis).

One Yale workshop participant summarized the major reasons fake news is damaging: (1) competitiveness; (2) visibility; (3) it is subject to confirmation bias; (4) it is subject to social media algorithms that can bring it to top of a user’s newsfeed – all issues the pope addressed as well. Thus, the sections that follow will explain why and how each of these structural factors give misinformation the power to spread (“Fighting Fake News Workshop Report” 5).

The increase in the amount of and availability of news

Misinformation has the influence and reach it does because of the way the human brain processes information. Research conducted by Filippo Menczer and colleagues found that the high degree of information users are exposed to contributes to low attention spans (Menczer et al.). When there is an overwhelming amount of information presented to a user, many will not

sort through it all to determine which information is most credible. Because of these finite attention spans, Menczer's study found that low-quality content was just as likely to go viral than high-quality information, explaining the popularity of misinformation during the election. According to members of the Yale workshop, because of users' limited attention spans and existing biases, it is common for people to retweet or share an article based on just the headline without ever having opened the article to read it ("Fighting Fake News Workshop Report" 3). This allows misinformation to be shared and seen by more users who will then repeat the cycle of accepting the information in the headline and promoting the piece by sharing it. "If we see a crowd of people running, our natural inclination is to run as well," the workshop report said, explaining how human beings are more likely to believe there is validity in something if we see others promoting it.

This increase in the amount of and availability of news has also made it increasingly difficult to distinguish between mainstream journalism and other forms of information, which can often appear similar to journalism and most often are ordinary people posting about news via blogs and social media sites. The ability for anyone with access to the Internet to publish content that looks and reads like a verified news source, when it is actually a blog written by a citizen that does not operate under the same code of ethics traditional journalists must. Although at times "citizen journalism" – such as a collection of tweets from an event – can aid traditional journalists in their reporting. However, the increased prevalence of blogs and independent news sources begs some questions: Can online news consumers tell the difference between an authentic news source and a blog run by a regular citizen -- or a foreign adversary-backed company? Do these alternative sites lower users' standards for the news they read? Do they

contribute to growing misunderstanding of the role of a journalist and/or a growing mistrust of the news media as a whole?

A 2016 study conducted by Arkaitz Zubiaga and colleagues at the University of Warwick in Coventry, United Kingdom analyzed the way rumors about breaking news are spread, supported or refuted on social media (Zubiaga et al.). The research team collected 330 rumor threads (4,842 tweets) associated with 9 newsworthy events from the protests in Ferguson, Missouri following the death of 18-year-old Michael Brown, an African-American, who was shot by a white police officer, to Vladimir Putin's "disappearance" in March 2015 when the Russian President made no public appearances for 10 days and many rumors spread about his illness or death. In defining a rumor as a statement that generates substantial interest, the team chose tweets about these events that sparked a high number of retweets. The tweets were placed on a timeline to visualize the time the rumor was initially tweeted about, when responses to this rumor began and whether respondents diffused, supported or denied the rumor, and when the rumor was either proven false or true by authoritative sources. The degree of certainty with which authors of both source tweets and response tweets was measured, from an author expressing 100 percent certainty about a rumor to considering it as a dubious or unlikely occurrence. The type of evidence (if any) provided by authors of these tweets was also documented. The twitter conversion data collected demonstrated true rumors tend to be resolved faster than false rumors, with most true rumors being corroborated within 2 hours of the source tweet's publishing. On the other hand, false rumors circulate for about 14 hours before they are disproven. In their conclusion, Zubiaga and colleagues said this aligns with the "common sense" idea that proving a fact is inaccurate is more challenging than proving it is true. The study also

found that the conversation surrounding a rumor is very active in the early stages when the rumor is still unverified, meaning many users retweet the rumor within the first few minutes of it being online. This demonstrates human nature to share rumors anxiously and then losing interest in the story when it is resolved, especially when it is later proved to be false. The prevalent tendency of most users in these conversations was to support unverified rumors rather than express skepticism. It was also found that reputable sources with high follow ratios like news organizations will support the rumor regardless of it later being debunked, often providing evidence from external sources in their tweets. In contrast, users with low follow ratios are more likely to deny rumors irrespective of their truth or not, demonstrate uncertainty, and provide no evidence in their response or only evidence based on their own experience, opinions, or observations. This information highlights issues related to human responses to online rumors about ongoing news and points to ways journalists can behave responsibly by quickly verifying rumors and mitigating the impact false rumors can have. A good summary of the issues this study highlighted was expressed by media ethicist Stephen J.A. Ward as he commented on the tension that exists because professional journalists must share the online news sphere with tweeters, bloggers, and citizen journalists:

“The ‘democratization’ of media – technology that allows citizens to engage in journalism and publication of many kinds – blurs the identity of journalists and the idea of what constitutes journalism. In the previous century, journalists were a clearly defined group. For the most part, they were professionals who wrote for major mainstream newspapers and broadcasters. The public had no great difficulty in identifying members of the “press.” Today, citizens without journalistic training and who do not work for mainstream media calls themselves journalists, or write in ways that fall under the general description of a journalists as someone who regularly writes on public issues for a public or audience. It is not always clear whether the term “journalist” begins or ends. If someone does what appears to be journalism, but refuses the label ‘journalist’ is he or she a journalist? If comedian Jon Stewart refuses to call himself a journalist, but magazines

refer to him as an influential journalist (or refers to him as someone who does engage in journalism) is Stewart a journalist? Is a person expressing their opinions on their Facebook site a journalist? (Stephen J.A. Ward).

Emotions and echo chambers

Beyond humans' short attention spans, another element of human behavior contributes to the frequent sharing of low-quality information. Social media sites are centered around the sharing of emotional content – a practice that is reinforced and rewarded by other users. According to First Draft Coalition's disinformation report (Wardle et al.), each time a user posts content and it is liked, commented on, or shared, users experience a release of dopamine in the brain, the neurotransmitter that controls the brain's pleasure and reward centers, making it a pleasurable thing to share information that friends and followers react to. Because of this, First Draft holds social media contributes to the ongoing spread of misinformation, in part because users operate in segregated or polarized groups online. Because humans are social beings who seek affirmation from those in their social circles, users are likely to share posts that fit within the attitudes of their online social circles that will continue to be liked and shared. According to a discussion leader at the Yale workshop, most people choose to interact online with those who hold similar opinions, "unfollowing" or "unfriending" those whom they disagree with. As a result, social media users tend to operate in "echo chambers" and "filter bubbles," meaning they are never confronted with counter arguments or, if misinformation is circulating in these circles, are never met with the truth of a story. According to the First Draft report, people often use the number of retweets or shares a post has to determine its credibility. Further, existing research on the concept of "signaling" demonstrates that individuals may retweet or share content in order to

signal their alignment with a particular group, whether or not they believe the content they are endorsing (Kahan).

In 2015, researcher Brian Weeks studied the way human emotions can increase susceptibility to political misinformation (Weeks). A random selection of participants in Weeks' study were asked to take 2 minutes to write something about either immigration reform or the death penalty (issue manipulation) that makes them either angry or anxious (emotion manipulation). The other participants (control group) were asked to write about something that relaxes them. Weeks did this to simulate the type of emotional rhetoric that Internet users use when expressing their political opinions online. Following this, participants were asked to report the emotions they were feeling as a result of the exercise. Next, participants were given a news article attributed to the Associated Press that discussed the existence of public misperceptions about either immigration or the death penalty. These articles had been manipulated to contain either four pieces of misinformation or these four false claims plus corrective information that showed why the statements were false. This corrective information was attributed to a fictional fact-checking group. The misinformation was attributed to either Congressional Republicans or Democrats. The claims were based on real public misperceptions about each issue, but were explicitly false. Following their reading of the article, participants reported their belief in the claims made in the story. Weeks found anger can cause Internet users to view misinformation through a partisan lens rather than an open-minded perspective. Thus, anger encourages users to positively evaluate misinformation that aligns with their political ideologies. However, Weeks found that regardless of emotion or partisanship, if a user is met with information that corrects the misinformation, users' beliefs will shift toward more accuracy. Weeks' research

demonstrates that misinformation that intentionally creates anger in users' by confirming their existing political biases will be believable to the individual. If users are operating in online echo chambers, this type of news is all that they see on their social media news, further heightening the issue of political polarization. Because of the algorithmic set up of sites like Facebook, Google, and Twitter, misinformation that is liked, shared, or commented on more frequently will shift to a higher "rank" on a user's news feed or search results. As a result, as a Yale workshop participant stated, the visibility of these search results or posts can alter voter preferences without their knowledge of alternative viewpoints ("Fighting Fake News Workshop Report" 5).

IV. EXISTING NEWS LITERACY PEDAGOGY

An April 2017 Neiman Report story asked the question that often follows conversation about the causal factors and resulting challenges associated with information pollution: "Can news literacy be taught?" (Dyer). To explore the effectiveness of news literacy education, reporter John Dyer spent time in American high school classrooms where teachers are attempting to impart news literacy skills on students. He documents the opinions of two students at Kirkwood High School in St. Louis, one who challenged her peers who shared "news" on their social media from obscure conservative blogs and the other a reader of sites like these who defends the news she shares, saying that those who have tried to make her skeptical of it are "liberal."

"I know what they believe," said Monique Foster, the conservative student, of her friends who challenge the news she shares. "Nothing is going to change my opinion. I don't feel like I need to get into an argument. Your politics are right side or left side, and it's not going to shift. If

I knew someone had a different viewpoint on something, I would try not to bring it up. I would rather talk to my conservative friends about it.” This illustrates what has already been proven about the tendency of news consumers to want to operate in filter bubbles, and shows this polarization is strong even among young people. Dyer spoke with journalism teachers like Mark Newton of Mountain Vista High School near Denver, Colorado, who said he tries to instill an appreciation for truth, accuracy and the First Amendment in his students, but that the information ecosystem that has emerged as a result of social media has created opposition to what he teaches. “I felt like I failed as a teacher for 32 years,” Newton said. “It’s clearly evident that what I’m teaching about the media – a vast number of people don’t get it.” And, according to studies about readers’ cognitive biases and demand for “fake news,” Newton is correct: teaching news literacy is incredibly difficult. But is it possible?

With these challenges to news literacy in mind, several organizations have arisen with the mission of educating news consumers how to judge the authenticity and credibility of the news they consume via print, television, or Internet sources. Stony Brook’s Center for News Literacy curriculum, aimed at helping consumers develop a sense of “too good to be true,” has served as a model to other non-governmental groups that hope to combat the belief in and spread of misinformation online (“What is News Literacy?”) But have those championing the news literacy movement been effective in their practices? The following will discuss which teaching methods in news literacy education have shown measured success in addressing the misinformation challenges that exist in the modern digital era and which have not. In evaluating these methods, the extent to which news literacy education can improve the ways the public evaluates what they read can be better understood.

The components and audiences of news literacy curriculum

In order to measure the effectiveness of news literacy curricula, the components that make up a “typical” news literacy curriculum and the audiences this curriculum is geared toward must be examined first. Then, in comparing several news literacy courses with large reaches, one can determine which components of news literacy curriculum might be essential in the mission of educating news consumers how to discern fact from fiction. As the conversation about the need for news literacy curriculum has grown, so have the number of news literacy courses aimed at equipping news consumers with the tools to sort through the information they see online each day. Stony Brook’s Center for News Literacy, the News Literacy Project, and The American Press Institute are three major organizations that have developed curricula and resources pertaining to news literacy. In an analysis of these organizations’ news literacy education offerings, the following were the significant shared components of the lessons each organization had uniquely developed:

1. Explanation of the press’s purpose
2. Recognizing the difference between journalism and other media
3. Recognizing the difference between news and opinion
4. Evaluating the quality and reliability of sources cited
5. Understanding how implicit biases affect the way news is consumed and shared

These choices of focus are deliberate. The research conducted by Filippo Menczer regarding low attention spans and biases affect on the spread of misinformation (Menczer), the study conducted by Arkaitz Zubiaga about how false rumors are spread (Zubiaga), and Brian Weeks’ research (Weeks) on how human emotions influence sharing of media that may or may not be reputable all demonstrate a need for the public to be better informed about what an authentic news source looks like and what should be present in a news source for it to be

considered fact and not opinion. These lessons included in most news literacy curricula also demonstrates the importance of bringing implicit biases to the attention of users who may not know how these impact their own reading and sharing habits online.

Stony Brook's on-campus news literacy course separates the material into 8 concepts taught over a 14-week course. Anyone has the ability to access the lecture presentations, videos, recitation notes, and quiz materials from this course to use in their own news literacy course. The format of the class is as follows:

1. Why News Literacy Matters

- In the wake of the latest information revolution, it is up to the consumer to determine whether information is reliable and whether to publish it.

2. The Power of Information

- The power of print: Why Napoleon said: "Four hostile newspapers are more to be feared than a thousand bayonets."
- The power of images and video: They can move audiences and bring about change.
- The power of social media: How platforms like Twitter and Facebook spread and make news.
- Freedom of the press: How the First Amendment's guarantees are based on the conviction that the excesses of a free press a price are a price worth paying for keeping our government and other institutions in check.

3. Is It True? Part 1

- The concept of provisional truth: Because journalism is a snapshot in time, journalistic truth evolves as new evidence emerges. The lesson for news consumers: Follow a story over time.
- Context and transparency: Key concepts in the journey from fact to truth. Valuable news stories put information in context and are transparent about how reporters know what they know and don't know and why.
- Truth is more likely to emerge when you look at a story from different perspectives. Journalists do that by trying to include the voices of all involved.

4. But Is It True? Part 2: Verification

- How news organizations and consumers evaluate still images and videos.
- Assessing the value of polls, surveys and studies. Understanding the science of polling and evaluating reports of scientific breakthroughs.

- How the fight for page views, ratings and circulation can put journalistic values in peril.

5. What Makes News Different?

- Who is a journalist? Is “citizen journalism” really journalism? In a world where news consumers are also news producers, VIA becomes a litmus test.
- One of the keys to determining if information is reliable is being able to identify what it is: journalism, advertising, publicity, propaganda, entertainment or raw information.
- Understanding why advertising, promotion and propaganda pose as journalism.

6. Who Decides What’s Newsworthy?

- Universal News Drivers: Importance, Timeliness, Proximity, Magnitude, Prominence, Conflict, Human Interest, Change, Relevance, Unusualness.
- Great images and compelling video drive story play. They’re powerful tools for verification, but can distract or influence the perceptions of news consumers and skew news judgment.
- The rise of commenting, most-shared status, website algorithms and real-time analytics drive story selection and play online.
- As more and more people get their news through social media, news aggregating sites and apps, savvy consumers should identify news outlets they can trust and depend on to curate the news.

7. Fairness and Balance – Part 1 (Is it Fair? Is it Biased?)

- The selection and layout of Images in print and on websites can have an impact on and videos on balance and fairness. Editing and production techniques can do the same in video reports.
- Defining bias
- Three ways to spot bias

8. Fairness and Balance – Part 2 (When Journalists Take Sides)

- Distinguishing between legitimate opinion journalism and mere assertion
- Bewaring of loaded language

9. The Medium is The Message Part 1

- Newspapers and magazines still offer the most comprehensive coverage, but market forces, technological advances and demographic changes have dramatically reduced their resources and reach.
- Radio has survived by maintaining an intimacy and immediacy and developing its own style of storytelling.
- TV news is still the most powerful tool for following breaking news stories with compelling visuals, but it exists in an entertainment medium.

10. The Medium is The Message Part 2, Digital Media

- News websites and search engines have broadened the reach of news consumers while presenting them with new challenges — information overload, questions of authenticity and confirmation bias — in their pursuit of reliable information. A key lesson: Ranking on search engines does not necessarily indicate the reliability of a website or piece of information found online.
- The explosion of social media and the evolution of the news consumer from observer to news producer have brought not only a powerful level of engagement but also the proliferation of misinformation. Plus: How social media has been used in modern election campaigns.

11. Says Who? (Judging a report's reliability)

- The deconstruction process uses News Literacy concepts to analyze and dispassionately judge a report's reliability.
 - Summarize the main points: Do the headline and lead support them?
 - How close does the reporter come to opening the freezer? Is the evidence direct or indirect?
 - Evaluate the reliability of the sources using IMVAIN.
 - Is the reporter's work transparent? Does the reader learn what the reporter knows and does *not* know?
 - Does the reporter place the story in context, providing facts that surround an event or elements of a news story and provide meaning or significance?
 - Are the key questions answered? Who? What? When? Where? Why? How?
 - Is the story fair?

12. Deconstructing the News

- Students apply the principles of deconstruction to all forms of traditional media including video and audio news stories.
- For video news, analyze a series of “winners” and “sinners” and how you can tell the difference.

13. Deconstructing New Media

- Students learn to recognize the power and gauge the reliability of social media posts and websites
- A key lesson: Ranking on search engines does not necessarily indicate the reliability of a website or piece of information found online.
- The advent of crowdsourcing and "citizen journalists" has created new opportunities and challenges for both news outlets and news consumers.

Additionally, Stony Brook's Digital Resource Center at the Center for News Literacy offers "Lessons Ripped From the Headlines," (Johnson) open access news literacy activities using recent stories from real news sources as teaching opportunities. Each lesson contains a specific news literacy concept, such as assessing the strength and reliability of a source used in a story, several discussion questions about the piece, such as prompting students to answer whether or not there are missing perspectives or biased perspectives in the story. Stony Brook's website also contains international news literacy resources because of the Center for News Literacy's partnership with international programs in China, Russia, Poland, and others ("Overseas Partners") "Making Sense of the News," is a six-week online course at Hong Kong University's Journalism and Media Studies Centre co-launched by the Center for News Literacy is January 2017 ("Making Sense of the News: News Literacy Lessons for Digital Citizens").

Each week of the course is as follows:

Week 1: The power of information is now in the hands of consumers.

Week 2: What makes journalism different from other types of information?

Week 3: Where can we find trustworthy information?

Week 4: How to tell what's fair and what's biased.

Week 5: How to apply news literacy concepts in real life.

Week 6: Meeting the challenges of digital citizenship.

Lastly, Stony Brook has created "DIY News Literacy Lessons," templates for teachers to use as a framework for customizable news literacy lessons ("DIY News Literacy Lessons"). This concept of giving educators and organizations resources to create their own version of news literacy curriculum is a typical offering of many news literacy organizations.

In a similar structure as Stony Brook, Maryland-based nonprofit News Literacy Project (NLP) is focused on providing news literacy education resources to middle and high school

students, to be incorporated into classroom instruction, after-school programs, and online programs. The 12-lesson course focuses on increasing the following skills among its students:

- The ability to filter information.
- Knowing the First Amendment and a free press are vital to American democracy.
- Knowing challenges and enormous opportunities that come with today's news ecosystem.
- Knowing the standards of quality journalism empowers students as consumers and citizens.

NLP has created Checkology, an online class for grades 8-12 that includes lessons in identifying between real news, opinion, advertising, and propaganda online. As of February 2018, more than 11,7000 teachers in all 50 states, three U.S. territories and 86 countries have used Checkology in their classrooms, reaching more than 1.78 million students, according to NLP's site. NLP's curriculum also makes students practice the role of a journalist and acquiring reliable sources for a story as well as learning about the press's role in a democratic society, a concept that has been deemed critical by news literacy teachers. Beyond providing their own curriculum to educators, NLP offers consulting to educational institutions and other organizations who seek to develop news literacy programming. NLP states that embedding news literacy as an essential skill into American schools is the ultimate goal of their program, "giving every student an appreciation of credible journalism and the skills to be an active participant in a robust democracy" ("Our Mission"). Similarly, the American Press Institute has packaged news literacy resources on their site to be used by news organizations, educators, and students, including "Six questions to tell you what media to trust" ("News Literacy Resources"). API offers a news literacy curriculum for middle and high school educators to teach students how to

responsibly consume and produce news, resources for students who work for their school newspapers, and information for journalists who desire to support “News in Education” programs in their communities. Overall, Stony Brook has had the longest and largest reach of the three organizations.

In January 2017, Facebook launched its “Facebook Journalism Project,” after the site was criticized for the ways fake news was able to spread during the 2016 presidential election (Simo). When it announced the project, Facebook said its goal was to create strong partnerships with news organizations in order to contribute to a healthy news ecosystem that equips people with the knowledge they need to be responsible online news consumers. One aspect of the project are PSAs created in partnership with the News Literacy Project about the issue of information pollution, in order to promote news literacy on and off Facebook. A year later, Facebook has installed ways for users to easily report hoaxes if they see them, and surveys its users about their familiarity with and trust in news sources on their newsfeeds (Arbel). Facebook uses Poynter’s International Fact Checking Code of Principles to help identify hoaxes on its site. Additionally, Facebook is reworking its algorithm so that users see fewer posts from publishers, businesses and celebrities and more from their friends. This means the amount of news on Facebook will drop from 5 percent to 4 percent. Using the survey information about which sources users deem trustworthy, Facebook will review sources that received low scores to determine whether or not Facebook should cease their distribution. Facebook’s partnership with third-party news literacy nonprofits may point to an important partnership that should be developed between producers of news literacy curriculum and social media sites that are major distributors of news.

Measuring the effectiveness of news literacy courses

The typical news literacy pedagogy responds to many of the challenges associated with the online information disorder with activities that encourage critical thinking and appreciation for reliable news. However, it is unclear whether or not the lessons news literacy courses impart and the new habits of students are long-lasting. The issue is not that critical thinking skills cannot be taught, but that they are hard to measure. Director of Stony Brook's Center for News Literacy, Dean Miller, calls finding a way to measure the critical thinking skills of students before and after a news literacy course is the "Holy Grail" of news literacy education, because it is difficult to determine what their baseline critical thinking skills were before entering the course and because no one is quite sure how valid self-evaluations of these skills are (Beyerstein). Self-evaluations have been the major method used by Stony Brook in assessing if the news literacy skills of students were altered because of the course. On the whole, the skills students gain from Stony Brook's course seem to fade with time and lack of concept reinforcement.

In 2010, Stony Brook conducted a survey of 600 new graduates of their news literacy course and 400 students who did not take the course to study the success of their course (Weber). Stony Brook found the number of students who believe journalism protects democracy rose 21 percent after a news literacy course. The number who believed the news media has a "watchdog" responsibility rose 15 percent after completion of a news literacy course. Thus, there was a correlation between completing a news literacy course and gaining appreciation for the role of journalists in a democracy. However, when students were polled again a year after they completed the course and asked the same questions, the number of students who believed that journalism protected democracy dropped from 93 percent to 85 percent. Their belief in the

“watchdog” role of journalists decreased from 84 to 79 percent. Further, these students’ critical thinking skills were measured and showed a decline over time as well. When they first graduated, students who had completed the news literacy course had a slightly higher ability to assess reliability of information and whether or not information in a news story was fair compared to those who did not take the news literacy course. When polled a year later, more than a quarter of the students who completed the course were less likely to assess reliability and fairness of a news story. Interestingly, the students who did not take the course had improved in their ability to judge the reliability and fairness of a source, demonstrating that they had become more news literate while the students who took the course, had become less.

Jennifer Fleming of California State University chose to explore the Stony Brook model, not to measure its effectiveness, but to examine the reason for Stony Brook’s approach in news literacy education (“What Do Facts Have to Do with It?”). In 2010, Fleming visited Stony Brook, collecting hundreds of their news literacy resources, observing 26 classes, activities, and meetings focused on news literacy, and interviewing administrators, instructors, students, and news fellows of the program. The interviews showed that the instructors viewed journalism as a fact-finding industry and, as a result, news literacy education should teach methods of fact-finding to news consumers. Fleming organized the information from the documents she collected and the classes she observed into a matrix of “approaches to instruction” and “learning domains” – whether the instruction focused on the cognitive, emotional, aesthetic, or moral level of understanding the news. The results indicated that Stony Brook’s instruction is focused primarily on teaching students how to assess the veracity of news information and that their news literacy pedagogy is made up mostly of lessons and activities focused on developing cognitive

skills and abilities. Fleming held that this emphasis on developing skills for verification has likely come about because the journalists-turned-instructors of the news literacy program were taught the importance of conveying truth in order to educate readers so they place a high value on students recognizing truthful journalism from other misleading media. This emphasis on critical thinking makes sense, considering the purpose of media literacy education (not to be confused with news literacy education) has been said to be the development of critical thinking skills. However, W. James Potter, a professor in the Department of Communication at the University of California at Santa Barbara, says these critical thinking skills are vaguely defined and are used in news literacy as an “umbrella idea for an unspecified conglomeration of mental processes,” (Potter 680). In sum, students of news literacy programs may be gaining more appreciation for journalism than they are critical thinking skills, and even if the courses do enhance their critical thinking, this development is difficult to measure.

Criticism of existing methods, areas for improvement

Some experts have also criticized the focus of news literacy curricula on teaching students the practice of journalism and news production in a way that increases their appreciation for news gathering, but that does not necessarily expand their understanding of concepts like fairness, balance, and bias. At the 2010 Association for Education in Journalism and Mass Communication (AEJMC) conference, Renee Hobbs, a Professor of Communication Studies at the Harrington School of Communication and Media and founder of the Media Education Lab at the University of Rhode Island, presented her thoughts on ‘what works’ and ‘what doesn’t’ in news literacy education (Hobbs). In her talk, Hobbs held that, in order to have any effectiveness,

news literacy should follow a certain set of principles such as using example stories that have relevance in the students' lives; lessons focusing on the construction of news stories; using new ideas to directly support the practice of critical analysis and media consumption; and making connections between the lesson being taught in the classroom and the outside world so that students understand the reality of the situation of information disorder. Hobbs also points out three major practices in news literacy education that she deems ineffective. The first is teaching a news literacy course to non-journalism majors as any introductory journalism course would be taught, covering the process of newsgathering, as well as the First Amendment and media ethics. Classes like this can become unengaging to students who do not see how journalism has any bearing on their lives. Also, Hobbs says, when news literacy curriculum glorifies the ideals of American journalism, rather than bringing attention to the ways journalism has been negatively impacted by partisan politics, advertisers who pay for sponsored content, and bloggers who pose as traditional journalists. Hobbs said news literacy programs that introduce students to the positive aspects and challenges of the current news landscape through "critical inquiry" and "student-centered learning" are those that will be most effective in informing 21st century readers of all ages. In summary, Hobbs' view calls for a news literacy that has focuses similar to Stony Brook's model of developing critical thinking skills in students and helping them gain an understanding of the challenges to journalism that have occurred in the digital age. Ultimately, she says, news literacy should not be a rally-around-the-flag technique to increase appreciation of journalism in a time when its value and authenticity is in question. Instead, news literacy should point out the flaws in both the product and the consumer, and ultimately, should grant

members of a democracy factual information that contributes to their ability to be responsible citizens.

V. WHAT NOW?

An October 2017 Pew Research Center study (Anderson and Rainie), in partnership with Elon University's Imagining the Internet Center, asked a large group of technologists, scholars, practitioners, strategic thinkers and others to respond to this prompt:

"The rise of "fake news" and the proliferation of doctored narratives that are spread by humans and bots online are challenging publishers and platforms. Those trying to stop the spread of false information are working to design technical and human systems that can weed it out and minimize the ways in which bots and other schemes spread lies and misinformation..."**The question: In the next 10 years, will trusted methods emerge to block false narratives and allow the most accurate information to prevail in the overall information ecosystem? Or will the quality and veracity of information online deteriorate due to the spread of unreliable, sometimes even dangerous, socially destabilizing ideas?"**

Respondents were asked to choose one of two options: "The information environment **will improve** – In the next 10 years, on balance, the information environment will be IMPROVED by changes that reduce the spread of lies and other misinformation online" or "The information environment **will NOT improve** – In the next 10 years, on balance, the information environment will NOT BE improved by changes designed to reduce the spread of lies and other misinformation online."

Out of 1,116 respondents, 51 percent said the information environment will not improve and 49 percent said it will improve. Each respondent had to give a short explanation for why they answered the way they did. The experts that said it will not improve generally cited humans' preference and craving for echo chambers and the inability for our brains to keep up with

changes in technology. On the other hand, the 49 percent that said the information environment will improve generally said technology does have the power to fix the problems surrounding misinformation. They also generally said people have always adapted to change and that these challenges would be no different, because well-meaning people will come together to find solutions to the information pollution. They held better information literacy among citizens will enable consumers to judge the veracity of online content and, eventually, this will inhibit fake news' power. These survey results demonstrate two major things. The first is that many are pessimistic about future improvements to the information environment. The second is that news literacy education is just one part of the solution to this multifaceted problem.

This paper sought to overview the factors contributing to the spread of misinformation and the state of news illiteracy that has further contributed to the believability of this misinformation in order to make an argument for the importance of widespread news literacy education, particularly in a democracy. In order to evaluate which methods in news literacy education are best-designed to address the challenges of the modern digital era, I reviewed current news literacy pedagogy led by nongovernmental organizations seeking to combat the information pollution issue. Based on an evaluation of the existing methods in news literacy education, and a review of literature about the importance of developing critical thinking skills in assessing veracity of news, news literacy curricula that focuses on developing these skills, not just increasing appreciation of journalism, seems best-designed to address the misinformation challenge the exist in the modern digital era. However, effectiveness of any news literacy curriculum is difficult to measure because student self-evaluations after completion of a news literacy course are difficult to corroborate and something abstract like "critical thinking skills" is

difficult to quantify. I hold an effective news literacy education is possible, but because the discipline is somewhat young, it will take time to see the reading and sharing habits of users start to shift and the virality of misinformation to decline.

The responsibility in the fight against misinformation does not rest entirely on producers of news literacy curriculum. Although this paper has demonstrated initiatives in news literacy education are a step in the right direction in combating the spread of misinformation, news literacy only addresses part of the problem of information pollution as it exists currently. As long as readers still lack the skills to sort fact from fiction online, social media sites have a responsibility to develop solutions to their algorithms' creation of filter bubbles and echo chambers that have allowed misinformation to spread.

"I don't believe we'll be able to support a robust press unless we build an audience that will recognize the difference between journalism that matters and journalism that's junk," Stony Brook CEO Howard Schneider said. "...[one] that recognizes the difference between news, propaganda, entertainment, publicity, advertising and raw information, and unless we get an audience that can support quality journalism, appreciates quality journalism and sustains quality journalism, we won't have the kind of press in this country we need" (Schneider and Klurfeld).

A well-informed citizen is critical to the health of a democracy. In promoting critical thinking skills among citizens and educating them about the role of journalism, news literacy organizations are equipping citizens with the tools to make decisions about the trustworthiness of information they consume. If citizens of a democracy feel capable of sifting through the overwhelming amount of information online to identify what is accurate and what is not, they are

more likely to be active, responsible participants in a democracy who demand the press to produce quality information.

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